

The opinion in support of the decision being entered today was **not** written
for publication and is **not** binding precedent of the Board.

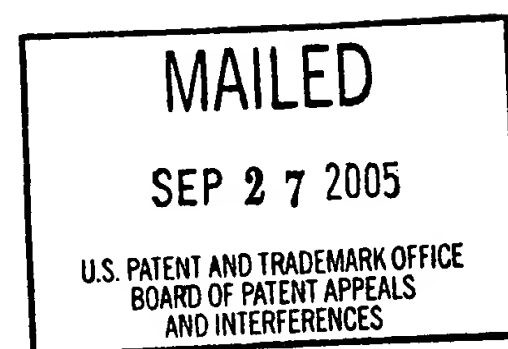
UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte DANIEL XU and TYLER A. LOWERY

Appeal No. 2005-2247
Application No. 09/976,641

ON BRIEF



Before JERRY SMITH, DIXON, and NAPPI, **Administrative Patent Judges**.
DIXON, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 11-14
and 16-30, which are all of the claims pending in this application.

We REVERSE.

BACKGROUND

Appellants' invention relates to reducing leakage currents in memories with phase-change material. An understanding of the invention can be derived from a reading of exemplary claim 11, which is reproduced below.

11. A memory cell comprising:

a substrate;

a phase-change material over said substrate;

a buried line of a first conductivity type formed in said substrate, said buried line including a more lightly doped region over a more heavily doped region and a more lightly doped region under said more heavily doped region;

a region of a second conductivity type opposite said first conductivity type over said line and under said phase-change material; and

a pair of trenches on either side of said buried line extending past said buried line and said region of a second conductivity type into said substrate under said buried line.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Holmberg et al. (Holmberg)	4,599,705	Jul. 08, 1986
Ovshinsky	5,359,205	Oct. 25, 1994
Slotboom et al. (Slotboom)	5,502,326	Mar. 26, 1996
Chang	6,015,995	Jan. 18, 2000
		(filed Feb. 27, 1998)

Claims 11, 12 and 16-30 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ovshinsky in view of Chang and Slotboom.¹

Claims 13 and 14 stand rejected under 35 U.S.C. § 103 as unpatentable over Ovshinsky in view of Chang and Slotboom further in view of Holmberg.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejections, we make reference to the answer (mailed June 23, 2004) for the examiner's reasoning in support of the rejections, and to the brief (filed May 03, 2004) and reply brief (filed August 03, 2004) for appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by appellants and the examiner. As a consequence of our review, we make the determinations which follow.

¹ Here, we note that the rejection has been modified from that set forth in the final rejection to add the teachings of Slotboom. Since appellants have not disputed this new grounds of rejection, we will review the rejection as set forth in the answer.

35 U.S.C. § 103

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness. **See In re Rijckaert**, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A *prima facie* case of obviousness is established by presenting evidence that the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed combination or other modification. **See In re Lintner**, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). Furthermore, the conclusion that the claimed subject matter is *prima facie* obvious must be supported by evidence, as shown by some objective teaching in the prior art or by knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. **See In re Fine**, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Rejections based on § 103 must rest on a factual basis with these facts being interpreted without hindsight reconstruction of the invention from the prior art. The examiner may not, because of doubt that the invention is patentable, resort to speculation, unfounded assumption or hindsight reconstruction to supply deficiencies in the factual basis for the rejection. **See In re Warner**, 379 F.2d 1011, 1017, 154 USPQ 173, 177 (CCPA 1967), **cert.**

denied, 389 U.S. 1057 (1968). Our reviewing court has repeatedly cautioned against employing hindsight by using the appellant's disclosure as a blueprint to reconstruct the claimed invention from the isolated teachings of the prior art. **See, e.g., Grain Processing Corp. v. American Maize-Prods. Co.**, 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988).

When determining obviousness, “the [E]xaminer can satisfy the burden of showing obviousness of the combination ‘only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.’” **In re Lee**, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002), citing **In re Fritch**, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). “Broad conclusory statements regarding the teaching of multiple references, standing alone, are not ‘evidence.’” **In re Dembiczak**, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). “Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact.” **Dembiczak**, 175 F.3d at 999-1000, 50 USPQ2d at 1617, citing **McElmurry v. Arkansas Power & Light Co.**, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993).

Further, as pointed out by our reviewing court, we must first determine the scope of the claim. “[T]he name of the game is the claim.” **In re Hiniker Co.**, 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). Therefore, we look to the language of independent claim 11 which recites “a buried line of a first conductivity type formed in said substrate, said buried line including a more lightly doped region over a more heavily doped region and a more lightly doped region under said more heavily doped region; a region of a second conductivity type opposite said first conductivity type over said line and under said phase-change material.” Here, we find that the language of independent claim 11 recites four regions formed in the substrate.

We find that each of Ovshinsky and Chang teach three separate regions of varied conductivity formed in the substrate and formed in epitaxial layers. While the examiner identifies at page 5 of the answer that the specific orientations of conductivity regions would have prevented leakage current between the n+ conductive lines 32 and the p- substrate 20 in the three layers, the examiner merely concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to have included this teaching into the manufacture of Ovshinsky. Moreover, the examiner maintains that “Chang teaches that pn diodes can alternatively be formed exclusively in bulk substrates without the inclusion of an epi layer, as opposed to being formed in the

combination of bulk regions overlying epi regions of a substrate.” (Answer at page 5.)

The examiner identifies no direct or express support for this finding, and we find from the Figures 2A-F of Chang that all of the regions of conductivity are “in” the substrate as the examiner maintains. Furthermore, even if we assume that the Chang does teach or fairly suggest the inclusion of all the layers of conductivity in the substrate, we are left with the mere assertion that it would have been obvious to one of ordinary skill in the art at the time of the invention to desire to reduce the leakage current and to add the additional lightly doped region used in the n type regions to the combination of buried regions and epi- regions taught by Ovshinsky.

Appellants argue that neither Ovshinsky or Chang teach the formation of an lightly doped region over a heavily doped region where both are formed in the substrate. (Brief at page 5.) We agree with appellants that neither of Ovshinsky or Chang teach or fairly suggest this aspect of the claimed invention and the examiner does not rely upon the teachings of Slotboom to teach or suggest this feature of the claimed invention. Appellants argue that there is no suggestion to modify both of the three layer configurations of Ovshinsky and Chang to form a four layer structure. (Reply brief at pages 2 et seq.) We agree with appellants.

Form our review of the examiner's statement of the rejection and the relevant teachings expressly set forth in the prior art references, we conclude the examiner has found most of individual parts of the claimed invention and attempts to reconstruct the claimed invention from the known parts. We find the examiner's rejection to be based upon improper hindsight reconstruction where many of the combinations of teachings require a number of further modifications. While these modification may have been within the level of skill in the relevant art, we find that the examiner has not met the initial burden of showing a teaching or convincing line of reasoning why it would have been obvious to one of ordinary skill in the art at the time of the invention to have made that further modification after the combination such as to form all the various regions of conductivity in the substrate rather than to additionally use epitaxial layers. Therefore, we find that the examiner has not established the initial *prima facie* case of obviousness of the invention recited in independent claim 11. Therefore, we cannot sustain the rejection of independent claim 11 and its dependent claims. Similarly, we cannot sustain the rejection of independent claim 21 and its dependent claims.

Additionally, we do not find that Holmberg remedies the deficiencies in the base combination. Therefore, we cannot sustain the rejection of dependent claims 13 and 14.

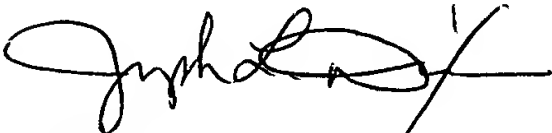
CONCLUSION

To summarize, the decision of the examiner to reject claims 11-14 and 16-30 under 35 U.S.C. § 103 is REVERSED.

REVERSED



JERRY SMITH
Administrative Patent Judge



JOSEPH L. DIXON
Administrative Patent Judge



ROBERT E. NAPPI
Administrative Patent Judge

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